Programme & The Book of Abstracts

Nineteenth Annual Conference

YUCOMAT 2017

Herceg Novi, Montenegro, September 4-8, 2017

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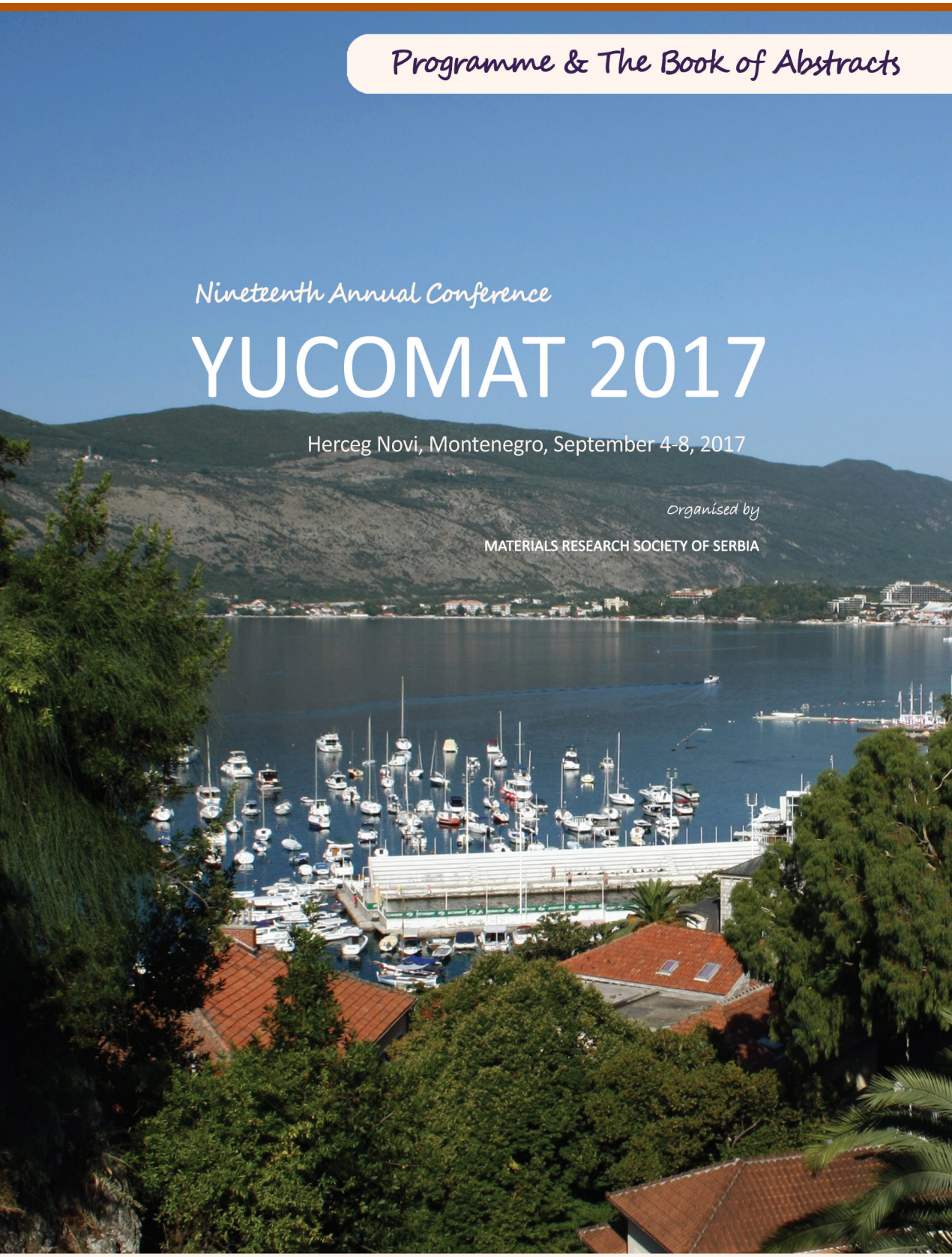

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Hunguest Hotel Sun Resort Herceg Novi, Montenegro,
September 4-8, 2017
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Programme
and
The Book of Abstracts

Organised by:
Materials Research Society of Serbia

Endorsed by:
Materials Research Society,
European Materials Research Society
and
Federation of European Material Societies

Title: THE NINETEENTH ANNUAL CONFERENCE
YUCOMAT 2017
Programme and The Book of Abstracts

Publisher: Materials Research Society of Serbia
Knez Mihailova 35/IV, P.O.Box 433, 11000 Belgrade, Serbia
Phone: +381 11 2185-437
http://www.mrs-serbia.org.rs

Editors: Prof. Dr. Dragan P. Uskoković and Prof. Dr. Velimir Radmilović

Technical editor: Aleksandra Stojičić

Cover page: Aleksandra Stojičić and Milica Ševkušić
Front cover: Modified Photo by Mercy; Wikimedia Commons (https://commons.wikimedia.org/wiki/Category:Herceg_Novi#/media/File:Herceg_Novi,_Montenegro_-_harbour.jpg); CC BY-SA 3.0
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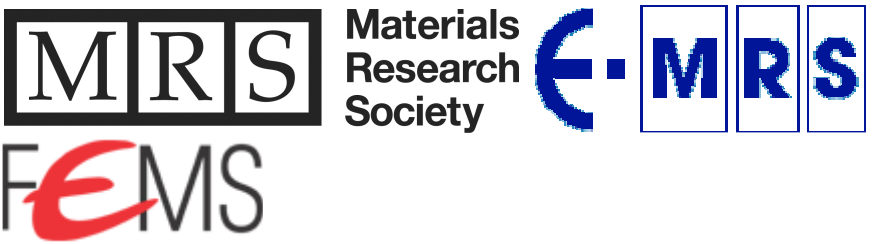
Acknowledgments: This conference is celebrating 20 years of MRS-Serbia.



Printed in: Biro Konto
Sutorina bb, Igalo – Herceg Novi, Montenegro
Phones: +382-31-670123, 670025, E-mail: bkonto@t-com.me
Circulation: 220 copies. The end of printing: August 2017

O.S.III.1.

Highly selective anticancer activity of core shell particles based on hydroxyapatite, chitosan lactate and different androstane derivatives

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Hybrid systems based on nano hydroxyapatites (HAp) are the subject of numerous studies in preventive and regenerative medicine. Special interests are directed towards the creation of a system based on HAp for use in a nano-oncology. The main objective of this research is directed towards the creation of a system with cytotoxic properties towards the cancer cells with the same time, minimum side effects. Carriers base on core shell of HAp/chitosan-poly(D,L)-lactide-co-glycolide (PLGA) loaded with androstane-based cancer inhibitor could be seen as promising drug delivery platforms for selective cancer therapies.
In this study we utilize an emulsification process and freeze drying to load the composite particles based on HAp nanocarrier, chitosane (Ch), PLGA and chitosan oligosaccharide lactate (ChOL) with 17β-hydroxy-17α-picolyl-androst-5-en-3β-acetate (A) and 3β,17β-dihydroxy-16-hydroxymino-androst-5-en (B), a chemotherapeutic derivatives of androstane. The picolyl androstane derivatives showed high potency in the cell inhibitors of hormone-dependent cancers (lung, prostate and colon cancer; adeno and cervix carcinoma; etc.).
1H NMR, 13C NMR and high-resolution time-of-flight mass spectrometry (MS) techniques confirmed the intact structure of the derivatives A and B. The thermogravimetric and differential thermal analysis (TGA, DTA) coupled with mass spectrometry was used to qualitatively confirm the drug loading process. FT-IR, XRD, AFM and DSC techniques have confirmed the success of androstane (A and B) loading process in core shell particles base on nano hydroxyapatite. All the synthesized particles were found to be spherical in shape with a uniform size distribution from d50=167 to d50=231 nm. Highly selective anticancer activity was noted towards the human lung carcinoma (A549) by A loaded HAp/Ch-PLGA and towards the human breast adenocarcinoma (MDA-MB-231) by B loaded HAp/ChOL. The obtained results of the DET and MTT tests were in agreement.

CIP- Каталогизација у публикацији
Народна библиотека Србије

66.017/.018(048)

MATERIALS Research Society (Beograd). Conference (19 ; 2017 ; Herceg Novi)
Programme ; and The Book of Abstracts / Nineteenth Annual Conference YUCOMAT 2017, Herceg Novi, September 4-8, 2017 ; organised by Materials Research Society of Serbia, [Belgrade ; editors Dragan P. Uskoković and Velimir Radmilović]. - Belgrade : Materials Research Society of Serbia, 2017 (Herceg Novi : Biro Konto). - XL, 124 str. ; 23 cm

Tiraž 220. - Registar.

ISBN 978-86-919111-2-6

1. Materials Research Society of Serbia (Beograd)

a) Наука о материјалима - Апстракти
b) Технички материјали - Апстракти

COBISS.SR-ID 241612044